CLAIMS

1. A method (**600**) of determining characteristic spin parameters (**T,Ti**) of a spun optical fiber (**105**), comprising:

performing (**610,615**) optical time-domain reflectometry measurements on the fiber, so as to obtain a State Of Polarization (SOP) spatial function from a backscattered electromagnetic field, said SOP spatial function being defined by a plurality of components; and

processing the SOP spatial function (**625-650**);

characterized in that

said processing comprises:

calculating a further spatial function related to the spatial first derivative of at least one of said components of the SOP spatial function;

identifying a spatial periodicity of said further spatial function; and

determining said characteristic spin parameters as a function of said spatial periodicity (**630-650**).

2. The method according to claim 1, in which said characteristic spin parameters include at least one between a spin inversion period (**Ti**) and a spin period (**T**).

3. The method according to claim 2, in which said further spatial function is a birefringence modulus.

4. The method according to claim 3, in which said determining the characteristic spin parameters includes locating peaks (**400**) in the birefringence modulus, and determining the spin inversion period based on a distance (**Dp**) between the peaks.

5. The method according to claim 3 or 4, further comprising:

calculating a spectrum of the birefringence modulus;

analyzing the calculated spectrum to locate at least one spike; and

determining the spin inversion period based on spatial frequency of the spike.

6. The method according to claim 5, in which said spectrum is calculated in correspondence of a measurement window of optical fiber length of prescribed width, the method further comprising:

causing the measurement window to shift along the fiber.

7. The method according to any one of the preceding claims, in which said performing optical time-domain reflectometry measurements on the fiber and calculating a further spatial function related to the spatial first derivative of at least one of said components of the SOP spatial function is repeated at least once after changing the fiber conditions.

8. The method according to claim 6, in which said changing the fiber conditions includes one or more among changing a fiber end at which the optical time domain reflectometry measurements are performed, vibrating the fiber, causing the fiber temperature to vary, waiting a time before repeating the measurements.

9. An apparatus (**300**) for determining characteristic spin parameters (**T,Ti**) of a spun optical fiber (**105**), comprising:

a source of electromagnetic radiation (**305,310,315,325,330**) optically coupled to the fiber;

a POTDR measurement apparatus (**350**) optically coupled to the fiber to obtain a State Of Polarization (SOP) spatial function from a backscattered electromagnetic field, said SOP spatial function being defined by a plurality of components; and

a data processor (**365**) for processing the SOP spatial function,

wherein the data processor is adapted to:

calculate a further spatial function related to the spatial first derivative of at least one of said components of the SOP spatial function;

identify a spatial periodicity of said further spatial function; and

determine said characteristic spin parameters as a function of said spatial periodicity.

10. The apparatus according to claim 9, in which said further spatial function is a birefringence modulus.